

## Utility Model

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## Surgical forceps, especially ethmoid bone forceps

The invention relates to a surgical forceps, especially an ethmoid bone forceps, with a shank, a suction channel  
5 extending in the shank and with a forceps jaw arranged at the distal end of the instrument with two jaw parts, wherein at least one jaw part is adjustable relative to the other jaw part when actuating a handle provided at the proximal end of the instrument by means of a rod for opening and closing the  
10 forceps jaw, said rod being axially adjustable and guided with the shank.

With some of the known forceps or, respectively, ethmoid bone forceps of this type the suction channel is formed by a  
15 separate tube arranged laterally of the shank which, with respect to manufacturing engineering, is complicated and results in an irregular contour and in a relatively large cross-section of the forceps. If, in contrast, the suction channel is integrated in the shank a smooth outer contour is  
20 obtained, but, in other respects, the problem occurs that a tube forming said suction channel, the interior space of the forceps shank and the actuating rod guided in said shank can be cleaned and disinfected only with a large expenditure of work involved.

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In this respect, dismountable forceps may be better, whereby the rod lies in an open sleeve and, after the shank is withdrawn, can be pivoted out of the sleeve and separated from the same. The previously required withdrawal of the shank is  
30 complicated, however. Moreover, the sleeve, which is also required to connect the handle to the forceps jaw, is an additional component which increases the structural expenditure of work, which would not be necessary if, like

with other forceps, the aforementioned connection to the shank is provided.

5 The object of the invention resides in overcoming these drawbacks and, accordingly, in providing a forceps which is easy to manufacture, has a smooth outer contour and can be cleaned without any problems due to a specific dismountability.

10 On the basis of a forceps of the aforementioned type this object is provided by forming the suction channel by a suction tube extending in the shank and by the shank having a longitudinal slot in which the rod is guided and out of which the rod can be pivoted about a bearing upon releasing a  
15 locking.

With respect to such a forceps both the rod and the interior space of the shank are freely accessible and can be optimally cleaned after the rod was pivoted out, especially in the case  
20 where the forceps can also be separated from the shank in a certain pivoted-out position.

The rod closely and with a tight sliding fit engages the longitudinal slot, wherein the surface area of the shank and  
25 the outwardly directed surface of the rod are flush in the area of the longitudinal slot so that, in this area too, the forceps has a smooth contour without any projecting parts.

The shank may be a flat hollow section with two rounded-off  
30 ends, wherein the longitudinal slot is incorporated in one of said ends, and a suction tube forming the suction channel is disposed on the opposite side at the other end in the hollow section. The surface area of the shank and the outwardly

directed surface of the rod are, in this case, located on the same radius in the area of the longitudinal slot so as to avoid projecting parts for the aforementioned reasons.

- 5 Expediently, the rod is mounted at the distal end of the instrument to be inwardly and outwardly pivoting and, in a position pivoted into the shank, is releasably locked in the proximity with a movable handle piece of the handle.
- 10 Further advantageous features of the forceps according to the invention are described in the dependent claims.

The invention will hereinafter be explained in more detail by means of the embodiments shown in the drawing, wherein

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Fig. 1 shows a view of the forceps with a rod for actuating the forceps jaw in a pivoted out and detachable position,

- 20 Fig. 2 shows the forceps according to Fig. 1 in the used state, partly shown in the longitudinal section and enlarged,

- 25 Fig. 3 shows a cross-section through the forceps in an enlarged representation according to the intersection line III-III in Fig. 2, and

- Fig. 4  
to 6 show embodiments for locking the proximal end of the  
30 rod.

The forceps comprises a handle 1, a shank 2, a forceps jaw 3 and a locking mechanism 4 for a rod 5 in the area of the handle 1.

- 5 The handle comprises a fixed handle piece 1.1 and a movable handle piece 1.2 which are designed ergonomically and are connected to each other via a pivoting axis 1.3. The movable handle piece 1.2 thereby forms a double-armed lever whereof the power arm is the handle element to be actuated and  
10 whereof the work arm 1.4 is designed to be forked.

- The fixed handle piece 1.1 of the handle 1 is provided with a receptacle for the proximal end of the shank 2 which is affixed in said receptacle by means of a clamping joint 2.1.  
15 By forming two lateral surfaces parallel to one another, the shank 2 consists of a flattened tube section whereof one radius surface is provided with a longitudinal slot 2.2. In the opposite inner radius surface a suction tube 2.3 is disposed and firmly connected to the tube section of the shank  
20 2 at the distal and proximal ends. At the proximal side the suction tube 2.3 is guided through a bore in the fixed handle piece 1.1 and carries a hose connection 2.4 at its proximal end.

- 25 The forceps jaw 3 is affixed at the distal end of the shank 2 and is formed of a fixed and a movable jaw part 3.1 and 3.2, respectively. The fixed jaw part 3.1 is provided with a channel 3.3 which merges into the distal end portion of the jaw part 3.1 and connects to the distal end of the suction  
30 tube 2.3 at the joint to shank 2. The movable jaw part 3.2 is mounted to be pivoting about a pivoting axis 3.4 and is actuated by axially adjusting the rod 5 with the handle 1.

Rod 5, which has a substantially rectangular cross-section, is linked on the movable jaw part 3.2. It is guided in and on the longitudinal slot 2.2 and engages with its proximal end on arm 1.4 of the handle piece 1.2 in an articulated manner. The rod 5 is forked at its distal end and encompasses in the working position (Fig. 2) a pin 3.5 on the movable jaw part 3.2. In its proximal end portion the rod 5 is provided with transverse slots 5.1 which mutually leave a rest web, so that the rod can be elastically upset in this area and secures the forceps against overload.

The connection of rod 5 with the movable handle piece 1.2 is formed to be releasable, wherein the retention is accomplished by the locking mechanism 4. For this purpose the rod 5 is, according to Fig. 4, provided with a journal 5.2 transversely penetrating the same in the area of its proximal end, and the movable handle piece 1.2 is provided with an upwardly open slot 1.5 for said journal 5.2. A lever 4.1 is mounted on the pivoting axis 1.3 of the handle 1, which is slideably pivotable on the flank of the movable handle piece 1.2 and comprises a hook-shaped recess 4.2 at its one end, which overlaps the journal 5.2 in a locked position.

According to the embodiment illustrated in Fig. 5 the locking is accomplished by a bow-shaped spring wire member 4.3 overlapping the rod 5 at the top, which is bent at its ends and engages in receiving bores 1.6 in the flanks of the movable handle piece 1.2. The legs of the spring wire member 4.3 are provided with dents 4.4 gripping over a journal 5.2 affixed on the rod 5 in a locked position.

For releasing the proximal end of the rod the lever 4.1 or, respectively, the spring wire member 4.3 is pivoted in the

direction of the arrow so that, by pivoting the rod 5 about the pin 3.5, the rod 5 can be brought into a position according to Fig. 1 and can then be separated from the forceps by withdrawing the distal forked end of the rod from pin 3.5.

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According to the locking mechanism 4 illustrated in Fig. 6 the rod 5 is provided with a transverse groove 5.3 which may be elastically expanded due to a bore 5.4 located next to the same. A pin 1.7 is provided on the arm 1.4 to penetrate the  
10 same in a transverse direction, onto which the rod may be pressed with its transverse groove 5.3, namely by elastically expanding the transverse groove.

For assembling the forceps the rod 5 is placed with its forked  
15 end onto pin 3.5 approximately in the position illustrated in Fig. 1 with a continuous line. The rod is then pivoted in the direction of the shank 2 until it completely disappears in the longitudinal slot 2.2 and supplements with its back surface the radius surface of the tube section forming the shank in a  
20 flush manner, for which purpose the back surface is configured under the same radius as the radius surface of the tube section. In other respects, once the rod adapts this position, the distal end of the rod positively grips over the pin 3.5 so as to fix this end of the rod.

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Moreover, in this position of the rod 5, the journals 5.2 thereof are - according to the embodiments of the locking mechanism 4 illustrated in Fig. 4 and 5, immersed into the slot 1.5 of the movable handle piece 1.2 so that the rod can  
30 be locked by pivoting the lever 4.1 or, respectively, the spring wire member 4.3 in the illustrated position. According to the embodiment shown in Fig. 6 a corresponding locking is

obtained by that the transverse groove 5.3 snaps over the pin 1.7 with an elastic expansion.

The forceps according to the invention can particularly be  
5 employed as an ethmoid bone forceps. Upon correspondingly  
modifying the forceps jaw the use as holding, cutting or HF  
forceps is also possible, however.



## CLAIMS:

1. Surgical forceps, especially an ethmoid bone forceps, with  
a shank (2), a suction channel extending in the shank (2)  
5 and with a forceps jaw (3) arranged at the distal end of  
the instrument and formed of two jaw parts (3.1/3.2),  
wherein at least one jaw part is adjustable relative to the  
other jaw part when actuating a handle (1) provided at the  
proximal end of the instrument by means of a rod (5) for  
10 opening and closing the forceps jaw, said rod being axially  
adjustable and guided with the shank (2), characterized in  
that the suction channel is formed by a suction tube (2.3)  
extending in the shank (2) and that the shank (2) is  
provided with a longitudinal slot (2.2) in which the rod  
15 (5) is guided and out of which the rod can be pivoted about  
a bearing upon releasing a locking.
2. Forceps according to claim 1, characterized in that the rod  
(5) can be separated from the forceps in a pivoted-out  
20 position.
3. Forceps according to one of claims 1 and 2, characterized  
in that the rod (5) closely and with a tight sliding fit  
engages in the longitudinal slot (2.2), and that the  
25 surface area of the shank (2) and the outwardly directed  
surface of the rod (5) are flush in the area of the  
longitudinal slot.
4. Instrument according to one of claims 1 to 3, characterized  
30 in that the shank (2) comprises a flat hollow section with  
two rounded-off ends and that the longitudinal slot (2.2)  
is incorporated in one of said ends and the suction tube

(2.3) forming said suction channel is disposed on the opposite side at the other end in the hollow section.

5. Instrument according to one of claims 3 and 4, characterized in that the surface area of the shank (2) and the outwardly directed surface of the rod (5) are located on the same radius in the area of the longitudinal slot (2.2).

6. Instrument comprising one adjustable and one stationary jaw part (3.2/3.1) according to one of claims 1 to 5, characterized in that a channel (3.3) is formed in the stationary jaw part (3.1), whereof the one end merges into the jaw portion and whereof the other end is connected to the suction tube (2.3).

7. Instrument according to one of claims 1 to 6, characterized in that the rod (5) is mounted at the distal end of the instrument to be inwardly and outwardly pivoting and, in a position pivoted into the shank (2), is releasably locked in the proximity with a movable handle piece (1.2) of the handle (1).

8. Instrument according to one of claims 1 to 7, characterized in that the rod (5) is provided with slots (5.1) at its proximal end portion and can be elastically upset.

9. Instrument according to one of claims 1 to 8, characterized in that for locking the rod (5) on the movable handle piece (1.2) a lever (4.1) mounted on the handle (1) with a hook-shaped recess (4.2) is provided and that the rod (5) comprises at its proximal end a journal (5.2) penetrating the same in a transverse direction, which is overlapped by the recess (4.2) of the lever (4.1) in the locked position.

10. Instrument according to one of claims 1 to 8, characterized  
in that the locking of the rod (5) on the movable handle  
piece (1.2) is accomplished by a bow-shaped spring wire  
member (4.3) engaging with bent-off ends in receiving bores  
5 (1.6) in the flanks of the movable handle piece (1.2) and  
comprising dents (4.4) on its legs which overlap a journal  
(5.2) on the rod (5) in the locked position.
11. Instrument according to one of claims 1 to 8, characterized  
10 in that for locking the rod (5) on the movable handle piece  
(1.2) the same is provided with a transversely arranged pin  
(1.7) and the rod (5) is provided with a transverse groove  
(5.3) at its proximal end, wherein the transverse groove  
(5.3) can be pressed over the pin (1.7) with an elastic  
15 expansion.